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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,013	07/19/2001	Makoto Yoshino	TIJ-29448	8724
23494	7590	06/18/2002		EXAMINER
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			GEYER, SCOTT B	
			ART UNIT	PAPER NUMBER
				2829

DATE MAILED: 06/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.	Applicant(s)	
09/909,013	YOSHINO ET AL.	
Examiner	Art Unit	
Scott Geyer	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 28 January 2002.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-13 is/are pending in the application.

4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 5-10 and 12 is/are rejected.

7) Claim(s) 11 and 13 is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 19 July 2001 is/are: a) accepted or b) objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)      4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_      6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-4, drawn to a semiconductor device, classified in class 257, subclass 668+.
  - II. Claims 5-13, drawn to a method of making a semiconductor device, classified in class 438, subclass 125+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the method claims recite an encapsulation step for coating and protecting a chip. Device claims 1-4 do not recite any encapsulation of a chip.
  3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
  4. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with William Kempler on 16 May 2002 a provisional election was made without traverse to prosecute the invention of Group II, claims 5-13. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-4 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Priority***

6. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

7. Figure 10 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

8. The disclosure is objected to because of the following informalities:  
Page 12, line 4: change "conductor pattern 20" to - - conductor pattern 18 - -;  
Page 12, line 28: change "become" to - - becomes - -.

Appropriate correction is required.

9. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract

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on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

**9A.** Lines 3, 4 and 14 of the abstract should be deleted.

**9B.** Notation for characters p, L, n and m should be highlighted using bolding, italics or parentheses.

#### ***Claim Objections***

**10.** Claims 5, 6, 7 and 9 are objected to because of the following informalities: notation for characters p, L, n and m should be highlighted in claim using bolding, italics or parentheses. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

**11.** The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**12.** Claims 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by applicant's admitted prior art.

As to **claim 5**, applicant's prior art figure 10 discloses a thermoplastic film (110) used as a substrate for carrying semiconductor chips. The film has two rows of sprocket holes (112), each row disposed along an edge of the film. The film also has a

plurality of through holes (not depicted, as stated in specification page 1, line 30) which are situated under circuit patterns (114). The circuit patterns (114), and thus the through holes, are situated between the two rows of sprocket holes (112).

As to **claim 6**, applicant's figure 10 discloses multiple sprocket holes (112) which thus must have a certain pitch **L**, and a plurality of through holes (not pictured) which thus must have a pitch **p**. Further, as neither **n**, **m**, **L** or **p** are defined by the specification, drawings or claims, any two integers **n** and **m**, where **n<m**, could satisfy the equation  $(m*p)=(n*L)$ .

***Claim Rejections - 35 USC § 103***

**13.** The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**14.** Claims 7, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Cho (6,235,555).

As to **claim 7**, Applicant's admitted prior art teach an insulation film used as a substrate for semiconductor devices as shown above in paragraph 12. Applicant's disclosed prior art further teach sprocket and through holes.

Applicant's admitted prior art does not specifically teach forming through holes along a transverse direction in a region between sprocket holes, and moving the insulation film in a length-wise direction.

However, Cho teach sprocket holes used to (figure 9, numeral 71) formed along both sides of the insulation film, i.e. reel-deployed printed circuit board (70). The sprocket holes are sued to advance the film along, in combination with toothed sprocket mechanism. As the film is advanced, through holes are formed in the film (column 4, line 22 et seq.). Also, since neither  $n$  nor  $L$  are defined by applicant's specification, drawings or claims, the sprockets as disclosed by Cho also have a pitch  $L$ , and they are moved a length  $n*L$  by the sprocket tooth mechanism.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method as disclosed by applicant's admitted prior art with a mechanism to move the film and form through holes as taught by Cho. The sprocket holes are used to assist in consistent advancing of the film through manufacturing steps, so that all other through holes necessary for manufacturing may also be made consistently.

As to **claim 8**, applicant's admitted prior art teach forming circuit patterns (figure 10, numeral 114) and conductor patterns (116) on the film, which are connected (specification page 2, lines 1-4).

As to **claim 12**, applicant's admitted prior art teach forming circuit patterns (figure 10, numeral 114) on the film and bonding a semiconductor chip to the circuit pattern formed (specification page 2, lines 14 et seq.). Applicant's admitted prior art also teach forming conductor patterns (116) on the film and electrically connecting the circuit patterns and the conductor patterns (specification page 2, lines 1-4).

15. Claims 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art.

As to **claim 9**, applicant's prior art figure 10 discloses a thermoplastic film (110) used as a substrate for carrying semiconductor chips. The film has two rows of sprocket holes (112), each row disposed along an edge of the film. The film also has a plurality of through holes (not depicted, as stated in specification page 1, line 30) which are situated under circuit patterns (114). The circuit patterns (114), and thus the through holes, are situated between the two rows of sprocket holes (112). Applicant's figure 10 discloses multiple sprocket holes (112) which thus must have a certain pitch  $L$ , and a plurality of through holes (not pictured) which thus must have a pitch  $p$ . Also, applicant's admitted prior art teach forming circuit patterns (figure 10, numeral 114) and conductor patterns (116) on the film, which are connected (specification page 2, lines 1-4). The circuit patterns have main lines which cross over the entire section of film depicted by figure 10. Applicant's admitted prior art also teach mounting a chip onto the film, sealing with a molding compound and punching out individual packages (specification page 2, line 14 et seq.).

Applicant's admitted prior art does not disclose a 'sub-line' electrically connecting the circuit patterns to the conductor patterns.

However, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the method as disclosed by applicant's admitted prior art with a 'sub-line' to provide electrical connection between the conductor pattern and

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the circuit pattern, as applicant's admitted prior art does disclose that such a connection between the two does exist.

As to claim 10, applicant's admitted prior art teach a plating step using conductor patterns (116) and bridge (118) (see specification page 2, line 3 et seq.).

***Allowable Subject Matter***

**16.** Claims 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 11 and 13, which depend on independent claim 9 and 10 respectively, teach a dicing step wherein the dicing blade has a blade trim width which is wider than the wiring width of the 'sub-line' of the conductor pattern and the 'sub-line' is not left behind on the insulation film after the dicing step has been performed. The cited prior art does not teach dicing using a dicing blade having a blade width wider than the wiring width of the 'sub-line'.

***Conclusion***

**17.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Geyer whose telephone number is (703) 306-5866. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. The examiner may also be reached via e-mail: [scott.geyer@uspto.gov](mailto:scott.geyer@uspto.gov)

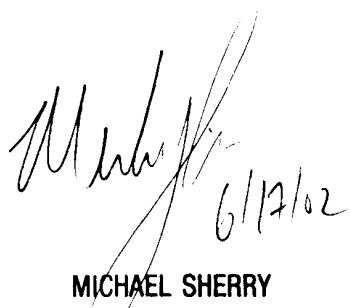
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (703) 308-1680. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

sbg  
June 4, 2002

  
6/12/02  
MICHAEL SHERRY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800